

**POET-DSM Project Liberty Plant LCFS Pathway  
for the Production of Cellulosic Ethanol from Corn Stover Feedstock**

**Response to Public Comment**

The public comments received during the public comment period which initiated on December 17, 2015, and ended on December 26, 2015 were related to the following two issues described below. The original comment is available at [http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs2a2bcomments-  
ws&comment\\_num=57&virt\\_num=32](http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs2a2bcomments-<br/>ws&comment_num=57&virt_num=32)):

**Comment**

The public commenter's comments were related to the following issues:

- (1) Crops that produce large root masses and large amounts of stover provide valuable biomass carbon which enriches soil organic carbon stocks. Modern high yield corn is one of the very few annual crops that produce enough unharvested carbon rich biomass to build soil organic carbon (SOC) stocks and this reduces atmospheric CO<sub>2</sub>.
- (2) However, removal of corn stover from farms around the POET-DSM Project Liberty Plant and subsequent use as cellulosic ethanol feedstock will reduce the magnitude of the SOC increase, and this should be accounted for in the life cycle analysis of GHG emissions from the corn grain ethanol pathway, and/or the corn stover ethanol pathway.

The commenter urged ARB to “consider and adjust the carbon intensity of the corn grain ethanol pathways to reflect the positive impact retained corn stover has on climate change.”

**POET-DSM Response**

In response to the public comments identified above, the applicant POET-DSM Project Liberty responded by stating that POET-DSM Project Liberty's corn stover harvest or removal rates are not expected to exceed 25 percent of the total residue left on the ground. At this harvest rate, the applicant does not believe that removal of corn stover will have any significant impact on SOC. In addition, POET-DSM Project Liberty agrees with the commenter that corn farming with higher crop yields could lead to a SOC increase, and urged ARB to consider SOC sequestration in the lifecycle analysis for corn farming.

## **ARB Response and Action**

Staff carried out a review of literature on corn stover removal and SOC loss. Although there are several SOC modeling and short-term field studies to consider, there is a dearth of long-term empirical-based field studies (greater than 20 years). While data modeling and short-term studies indicate a possibility of SOC loss from corn stover removal, there is a higher degree of uncertainty on SOC loss over a longer period of time since SOC loss or gain dynamics take several years to manifest. ARB believes that a sufficient number of long-term field studies will be required to reliably quantify SOC loss from corn stover removal to consider its inclusion into a lifecycle analysis (LCA) for the LCFS. In lieu of possible SOC loss from corn stover harvest, ARB shall require POET-DSM Project Liberty to limit corn stover removal to no more than 25 percent of an average crop yield from regions/farms where the feedstock is sourced. The corn stover removal rates shall also be contingent upon future research results identifying sustainable crop residue removal rates, and crop yields for the region.

In response to the comment on SOC sequestration potential from higher yields of corn, there are several issues to consider:

- There is no consensus on quantifiable sequestration of soil organic carbon from corn and biomass;
- There is year-to-year variability of corn yields and this could have impacts on quantity of residue available for sequestered carbon; and
- Higher yields of corn may require higher agricultural chemical inputs with its attendant environmental impacts.

When detailed studies addressing the issues identified above become available, staff will evaluate the inclusion of such impacts in the LCA of crop-derived biofuels.

ARB is in the process of considering a monitoring and verification program for the LCFS. Sustainable harvesting of corn stover may be considered as part of this process. In the interim, ARB reserves the right to examine the applicant's supply chain for corn stover harvesting and procurement. Until new guidelines are developed, applicant POET-DSM Project Liberty will harvest no more than 25 percent of the corn stover residue for biofuel production at farms that supply corn stover to the cellulosic ethanol production facility.

Staff recommends that the POET-DSM Project Liberty's application for Method 2B LCFS pathway be approved with the Applicable Operating Conditions set forth in the Staff Summary.